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Motor Competence and Its Association with Exercise Motivation in Children Aged 8 and 9

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Abstract: This study examined the relationship between motor competence and exercise motivation in 37 children aged 8 and 9. Motor skills were assessed using the *MABC-2 test*, and motivation through the *Participation Motivation Questionnaire (PMQ)*. Results showed partial associations between balance and overall motor performance with motivation subscales related to fitness, social status, sporting events, and peer activities. Fine motor skills and object control showed no significant links to motivation. No significant gender differences were found in motivation, although girls outperformed in fine motor tasks and boys in object control. Findings highlight the importance of motor skills in supporting children's motivation for physical activity.

Keywords: motor competence, motivation for exercise, young children.

Introduction

It is important to encourage children to move and exercise because physical activity contributes to their physical, mental, and social development (Nagy & Lazinica, 2017; Malina et al., 2024).



Motor competence refers to the ability to perform motor skills and movement patterns, enabling active participation in physical activity (Castelli & Valley, as cited in Šerbetar et al., 2012). Developing these competencies in childhood creates a foundation for a healthy and active life (Stodden et al., as cited in Gao & Wang, 2019).

Motor development is a continuous process involving changes in movement abilities, influenced by biological, environmental, and social factors (Malina, 2004; Armstrong & Van Mechelen, 2008). Motor domains include fine and gross motor skills. Fine motor skills involve precise movements, such as holding a pencil or buttoning a shirt, while gross motor skills involve larger body movements, such as running and jumping (Goodway et al., 2019; Humble et al., 2024).

Motor competence influences cognitive, emotional, and social development and promotes engagement in play and activities (Tan & Chia, 2024; Rudd et al., as cited in Duncan et al., 2022). Its development facilitates the acquisition of everyday skills and independence in childhood (Arufe-Giráldez et al., 2021).

Well-designed physical education programs are essential for children's overall development and for increasing their physical activity levels (Zhang et al., 2022). A low level of motor competence can negatively affect physical and mental health and reduce participation in physical activity (Konrad et al., 2024).

The MABC-2 test (Henderson et al., 2007) is used to assess motor abilities and includes tasks related to fine motor skills, balance, and object control. Results are interpreted using a traffic light system – the green zone indicates typical development, yellow signals a risk, and red indicates significant difficulties.

Motivation (from Latin *movere* – to move) is the driving force that stimulates goal-directed behavior (Petz, 2005). It can be intrinsic (internal, related to enjoyment during the activity) or extrinsic (external incentives such as rewards or avoiding punishment) (Bosnar & Balent, 2009). Motives play a key role in all aspects of life, including participation in physical activity, and are divided into biotic (primary) and social (secondary) motives (Jakšić, 2003; Ciocan et al., 2017).

Research Aim

The main aim of this study was to examine the relationship between motor competence and motivation for exercise in children aged 8 and 9 years.

Research Methods

The study included 37 younger school-age children, 18 boys and 19 girls, aged 8 and 9 years. The research was conducted with parental consent, in accordance with the Ethical Code, ensuring anonymity and the right to withdraw.

Motor competence was assessed using the MABC-2 test (Henderson et al., 2007), which includes eight tasks measuring fine motor skills, gross motor skills and balance. Exercise motivation was examined using the *Participation Motivation Questionnaire* (PMQ; Gill et al., 1983), which contains 30 statements



across six subscales. Responses were collected on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Research Results

Table 1 presents the correlations between motor test domains and the subscales of the Participation Motivation Questionnaire.

Table 1

Correlations between motivation subscales and motor test domains

	1	2	3	4	5	6	7	8	9	10
1. Popularity	1									
2. Fitness	.28	1								
3. Relaxation	.08	.07	1							
4. Social Status	.33*	.59**	.11	1						
5. Sporting Events	.31	.75**	.16	.80**	1					
6. Sports Activities with Friends	.21	.49**	.12	.59**	.45**	1				
7. MABC-2 Fine Motor Skills	-.22	-.03	.03	.04	.21	-.07	1			
8. MABC-2 Throwing and Catching	.16	.10	.32	.03	.08	.01	-.03	1		
9. MABC-2 Balance	.18	.66**	.12	.42**	.54**	.38*	.06	.13	1	
10. MABC-2 total score	.09	.42**	.18	.26	.47**	.18	.55**	.52**	.69**	1

* $p < .05$, ** $p < .01$

Discussion and conclusion

The aim of this study was to examine the relationship between motor competence and motivation for exercise in children aged 8 and 9, using the MABC-2 test and the PMQ questionnaire. The results partially indicate a connection between the balance domain and the total motor score with the motivational scales: fitness, social status, sports events, and activities with friends. This highlights the importance of physical activity and social inclusion for the development of balance.

The fine motor domain was not associated with any of the motivation scales, which may suggest that fine motor skills are more often developed through individual, everyday activities rather than group-based physical activities. The same applies to the aiming and catching domain. The overall MABC-2 score was not associated with some scales (e.g., popularity, relaxation), and intercorrelations showed a lack of connection between specific motor domains.

An analysis of gender differences revealed that girls performed better on the drawing test (fine motor skills), while boys scored higher on the two-hand catching test (gross motor skills). Although girls had higher averages in balance and fine motor skills, the differences were not statistically significant. The findings are partly consistent with previous studies (e.g., Coetzee et al., 2023; Fairbairn et al., 2020),



although they differ from the results of Kjelsas et al. (2013), who reported that boys outperform girls in balance.

No statistically significant differences between genders were found in exercise motivation, although certain trends were observed—boys tended to associate physical activity with popularity, while girls linked it more with fitness and social status. Both boys and girls viewed physical activity as a way to relax and participate in sports events.

Regarding motor development, three children were in the *red zone* (indicative of possible disorder), five in the *yellow zone* (in need of monitoring), while the majority (29) fell within the *green zone*, indicating typical development.

Overall, the findings suggest that motor competence, particularly balance, is modestly related to certain aspects of exercise motivation in children. Promoting physical activity that fosters both motor skills and social engagement may support children's holistic development and sustained motivation for exercise.

References

- Armstrong, N., & van Mechelen, W. (Eds.). (2008). *Paediatric exercise science and medicine* (2nd ed.). Oxford University Press.
- Bosnar, K., & Balent, B. (2009). *Uvod u psihologiju sporta: Priručnik za sportske trenere*. Kineziološki fakultet Sveučilišta u Zagrebu.
- Ciocan, D., & Milon, A. (2017). Study regarding the motives of children's participation in sport activities. *LUMEN Proceedings*, 1, 159-168. <https://doi.org/10.18662/lumproc.rsacvp2017.15>
- Duncan, M. J., Foweather, L., Bardid, F., Barnett, A. L., Rudd, J., O'Brien, W., Foulkes, J. D., Roscoe, C., Issartel, J., Stratton, G., & Clark, C. C. T. (2022). Motor competence among children in the United Kingdom and Ireland: An expert statement on behalf of the International Motor Development Research Consortium. *Journal of Motor Learning and Development*, 10(1), 7-26. <https://doi.org/10.1123/jmld.2021-0047>
- Fairbairn, N., Galea, C., Wallen, M., Walker, K., Hodge, A., Badawi, N., & Loughran-Fowlds, A. (2020). Are boys and girls just different? Gender differences in the Movement Assessment Battery for Children, 2nd edition (MABC-2) suggest that they are. *Australian Occupational Therapy Journal*, 67(3), 229-236. <https://doi.org/10.1111/1440-1630.12646>
- Gao, Z., & Wang, R. (2019). Children's motor skill competence, physical activity, fitness, and health promotion. *Journal of Sport and Health Science*, 8(2), 95-97. <https://doi.org/10.1016/j.jshs.2018.12.002>
- Gill, D. L., Gross, J. B., & Huddleston, S. (1983). Participation motivation in youth sports. *International Journal of Sport Psychology*, 14, 1-14.



- Goodway, J. D., Ozmun, J. C., & Gallahue, D. L. (2019). *Understanding motor development: Infants, children, adolescents, adults* (8th ed.). Jones & Bartlett Learning.
- Griffiths, A., Toovey, R., Morgan, P. E., & Spittle, A. J. (2018). Psychometric properties of gross motor assessment tools for children: A systematic review. *BMJ Open*, 8(10), e021734. <https://doi.org/10.1136/bmjopen-2018-021734>
- Henderson, S. E., Sugden, D. A., & Barnett, A. L. (2007). *Movement Assessment Battery for Children—Second Edition (Movement ABC-2)* [Manual]. Pearson.
- Humble, A., Yu, M.-L., & Brown, T. (2024). Association between parent-proxy-reported and child-self-reported perceptions of children's motor competence and children's performance-based motor skill abilities. *Scandinavian Journal of Occupational Therapy*, 31(1), Article 2274883. <https://doi.org/10.1080/11038128.2023.2274883>
- Jakšić, J. (2003). Motivacija: Psihopedagoški pristup. *Kateheza*, 25(1), 5–16.
- Konrad, J. D., Marrus, N., Lohse, K. R., Thuet, K. M., & Lang, C. E. (2024). Motor competence is related to acquisition of error-based but not reinforcement learning in children ages 6 to 12. *Heliyon*, 10(12), e32731. <https://doi.org/10.1016/j.heliyon.2024.e32731>
- Malina, R. M. (2004). Motor development during infancy and early childhood: Overview and suggested directions for research. *International Journal of Sport and Health Science*, 2, 50–66. <https://doi.org/10.5432/ijshs.2.50>
- Malina, R. M., Antunes, A., Gouveia, É., Marques, G., Thomis, M., & Freitas, D. (2024). Growth, maturity status, motor proficiency and fitness of participants and non-participants in organised sports 7–10 years. *Annals of Human Biology*, 51(1), 2427590. <https://doi.org/10.1080/03014460.2024.2427590>
- Nagy, G., & Lazinica, B. (2017). Razlike u motoričkim sposobnostima djece (9–10 godina) nesportaša, nogometaša u otvorenoj školi te selekciji prvoligaškog nogometnog kluba. In V. Findak (Ed.), *Zbornik radova 26. Ljetne škole kineziologa Republike Hrvatske: Kineziološke kompetencije u područjima edukacije, sporta, sportske rekreacije i kineziterapije* (pp. 243–248). Hrvatski kineziološki savez.
- Navarro-Patón, R., Arufe-Giráldez, V., Sanmiguel-Rodríguez, A., & Mecías-Calvo, M. (2021). Differences on motor competence in 4-year-old boys and girls regarding the quarter of birth: Is there a relative age effect? *Children*, 8(2), 141. <https://doi.org/10.3390/children8020141>
- Payne, V. G., & Isaacs, L. D. (2024). *Human motor development: A lifespan approach* (11th ed.). Routledge. <https://doi.org/10.4324/9781032697147>
- Šerbetar, I., Jurčević-Lozančić, A., & Kurić, Ž. (2012). Relacije motoričkih i socijalnih kompetencija djece predškolske dobi. *Školski vjesnik*, 61(4), 415–428.



- Tan, J. S. Y., & Chia, M. (2024). Motor competence of children in Singapore using Movement ABC-2 test. *PeerJ*, 12, e18446. <https://doi.org/10.7717/peerj.18446>
- Zhang, J.-Y., Shen, Q.-Q., Wang, D.-L., Hou, J.-M., Xia, T., Qiu, S., Wang, X.-Y., Zhou, S.-B., Yang, W.-W., Heng, S.-Y., Lu, C.-C., Cui, L., & Yin, H.-C. (2022). Physical activity intervention promotes working memory and motor competence in preschool children. *Frontiers in Public Health*, 10, 984887. <https://doi.org/10.3389/fpubh.2022.984887>